

## CLAIMS:

1. A vehicle wheel information processing device comprising:

a plurality of vehicle wheel communication devices which are provided at a single vehicle wheel; and

5 a vehicle body communication device that communicates with the plurality of vehicle wheel communication devices, wherein

a transmission pattern of a signal transmitted from each of the vehicle wheel communication devices is set to be different to the transmission pattern of each other signal.

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2. The vehicle wheel information processing device according to claim 1, wherein

the plurality of vehicle wheel communication devices transmit the respective signals as respective return signals in response to a request signal  
15 from the vehicle body communication device.

3. The vehicle wheel information processing device according to claim 2, wherein

a transmission start timing for the each return signal transmitted in  
20 response to the request signal is set to be different for each vehicle wheel communication device.

4. The vehicle wheel information processing device according to claim 2, wherein

25 each vehicle wheel communication device transmits the return signal a plurality of times, and

a transmission cycle of each return signal is set to be different for each vehicle wheel communication device.

5. The vehicle wheel information processing device according to claim 2, wherein

each vehicle wheel communication device transmits the return signal a plurality of times, and

5 a transmission interval of each return signal is set at random such that the respective transmission intervals of the vehicle wheel communication devices are mutually different.

6. A vehicle wheel information processing device according to claim 1 to 5, wherein

each vehicle wheel communication device transmits the signal to the vehicle body communication device, each signal having a distinguishing characteristic that is different to a distinguishing characteristic of the signal transmitted from each other vehicle wheel communication device.

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7. The vehicle wheel information processing device according to claim 6, wherein

the distinguishing characteristic is the individual identification number of the vehicle wheel communication device, the respective identification numbers for each of the vehicle wheel communication devices being mutually different, and

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each vehicle wheel communication device transmits the signal including the identification number thereof to the vehicle body communication device.

25 8. The vehicle wheel information processing device according to claim 7, wherein

the vehicle body communication device transmits a request signal including at least one of the identification numbers to the vehicle wheel communication devices, and

each of the vehicle wheel communication devices is configured to transmit a return signal to the vehicle body communication device in the case that its individual identification number is included within the received request signal, whereby the transmission pattern of the signal transmitted from each  
5 of the vehicle wheel communication devices is set to be different to the transmission pattern of each other signal.

9. The vehicle wheel information processing device according to claim 6, wherein

10 the distinguishing characteristic is a data format of each signal transmitted from each vehicle wheel communication device, the data formats of the respective signals transmitted from each vehicle wheel communication device being mutually different.

15 10. The vehicle wheel information processing device according to claim 6, wherein

the distinguishing characteristic is a magnitude of a value of each signal transmitted from the each vehicle wheel communication device, the respective magnitudes of the values of the respective signals transmitted from each  
20 vehicle wheel communication device being mutually different based upon an attachment position of each vehicle wheel communication device, and

the vehicle body communication device analyzes the values of the signals transmitted from the respective vehicle wheel communication devices, and determines which of the signals has been transmitted from which of the  
25 vehicle wheel communication devices based upon the analysis.

11. The vehicle wheel information processing device according to claim 10, wherein

the vehicle body communication device analyses a history of each value

of each signal transmitted from each vehicle wheel communication device, and determines which of the signals has been transmitted from which of the vehicle wheel communication devices based upon the analysis.

- 5 12. The vehicle wheel information processing device according to claim 10, wherein

the vehicle body communication device analyses the magnitude of each value of each signal transmitted from each vehicle wheel communication device, and determines which of the signals has been transmitted from which  
10 of the vehicle wheel communication devices based upon the analysis.

13. A vehicle wheel information processing device comprising:

a plurality of vehicle wheel communication devices which are provided at a single vehicle wheel; and

- 15 a vehicle body communication device that communicates with the plurality of vehicle wheel communication devices, wherein

the plurality of vehicle wheel communication devices include a first vehicle wheel communication device that directly communicates with the vehicle body communication device, and a second vehicle wheel  
20 communication device that indirectly communicates with the vehicle body communication device by using the first vehicle wheel communication device as a relay.

14. The vehicle wheel information processing device according to claim 13,  
25 wherein

the single wheel is provided with a first detection sensor that detects first vehicle wheel information, and a second detection sensor that detects second vehicle wheel information, the first detection sensor being included in the first vehicle wheel communication device, and the second detection sensor

being included in the second vehicle wheel communication device.

15. The vehicle wheel information processing device according to claim 14, wherein

5       the vehicle body communication device transmits a request signal to the first vehicle wheel communication device, and

          in response to the transmitted request signal, the first vehicle wheel communication device (i) transmits a first signal including the detected first vehicle wheel information and an identification number for the first vehicle  
10   wheel communication device, and (ii) transfers the request signal to the second vehicle wheel communication device, and

          in response to the transferred request signal, the second vehicle wheel communication device transmits a second signal including the detected second vehicle wheel information and an identification number for the second vehicle  
15   wheel communication device to the first vehicle wheel communication device, and

          the first vehicle wheel communication device transmits the second signal from the second vehicle wheel communication device to the vehicle body communication device.

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16. The vehicle wheel information processing device according to claim 14 or 15, wherein

          the first vehicle wheel information is information that is different to that of the second vehicle wheel information.

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17. The vehicle wheel information processing device according to any one of claims 14 to 16, wherein

          the first vehicle wheel communication device includes a communication wire for transmission of the detected first vehicle wheel information to the

second vehicle wheel communication device.

18. The vehicle wheel information processing device according to any one of claims 13 to 17, wherein

5       the vehicle wheel includes a wheel and a tire attached to an outer periphery of the wheel, and

          one of the first and the second vehicle wheel communication devices is provided at the wheel, and the other of the first and the second vehicle wheel communication devices is provided at the tire.

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19. The vehicle wheel information processing device according to claim 18, wherein

          the first vehicle wheel communication device is provided at the wheel, and the second vehicle wheel communication device is provided at the tire.

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20. A vehicle wheel information processing device comprising:

          a plurality of vehicle wheel communication devices which are provided at a single vehicle wheel; and

          a vehicle body communication device that communicates with the  
20       plurality of vehicle wheel communication devices, wherein

          each of the vehicle wheel communication devices has an identification number that is different to the identification number of each other vehicle wheel communication device,

          the vehicle body communication device transmits a request signal  
25       including at least one of the identification numbers to the vehicle wheel communication devices, and

          each of the vehicle wheel communication devices is configured to transmit a return signal to the vehicle body communication device in the case that its individual identification number is included within the received request

signal.

21. A vehicle wheel information processing method for receiving and processing vehicle wheel information from a plurality of vehicle wheel communication devices provided at a single wheel, the method comprising:

a first step in which respective signals of each of the vehicle wheel communication devices are transmitted to a vehicle body communication device using a transmission pattern that is different for each vehicle wheel communication device; and

10 a second step in which the respective signals transmitted from each vehicle wheel communication device are received by the vehicle body communication device.

22. The method according to claim 21, further comprising:

15 a third step in which a request signal from the vehicle body communication device is transmitted to the vehicle wheel communication devices, wherein

each vehicle wheel communication device transmits the signal in response to the request signal.

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23. The method according to claim 21 or 22, further comprising:

a fourth step in which the vehicle body communication device determines which of the signals has been transmitted from which of vehicle wheel communication devices based on the respective transmission patterns.

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24. A vehicle wheel information processing method for receiving and processing vehicle wheel information from a plurality of vehicle wheel communication devices provided at a single wheel, the method comprising:

a first step in which a request signal including at least one identification

number for at least one of the vehicle wheel communication devices is transmitted to the vehicle wheel communication devices from the vehicle body communication device; and

5 a second step in which the vehicle body communication device receives at least one return signal, from the vehicle wheel communication device whose identification number is contained in the request signal.

25. A vehicle wheel information processing method for receiving and processing vehicle wheel information from a plurality of vehicle wheel communication devices provided at a single wheel, the method comprising:

10 a first step in which a first vehicle wheel communication device transmits a signal to a vehicle body communication device;

a second step in which a second vehicle wheel communication device transmits a signal to the first vehicle wheel communication device; and

15 a third step in which the first vehicle communication device transfers the signal received from the second vehicle wheel communication device to the vehicle body communication device.